



- 2 -
Serial Number 09/743,674

SEQUENCE LISTING

<110> Dlawer, Ala' Aldeen
Todd, Ian

<120> SCREENING FOR NEISSERIAL VACCINE CANDIDATES AND VACCINES AGAINST
PATHOGENIC NEISSERIA

<130> 15-840

<140> US 09/743,674

<141> 2001-01-10

<150> PCT/GB99/02205

<151> 1999-07-09

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<170> PatentIn version 3.1

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Tyr Ile Leu Lys Asn Asn Arg Gln Ile Lys Leu Ile Ala Ala Ser Val

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atc cag tcc aac ctt gac gaa ccc ttt tcc ggc agc att acc gta acc 358
Ile Gln Ser Asn Leu Asp Glu Pro Phe Ser Gly Ser Ile Thr Val Thr
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ggc gaa gaa gcc aaa gcc ctg cta ggc ggc ggc agc gtt acc gtt tcc 406
Gly Glu Glu Ala Lys Ala Leu Leu Gly Gly Gly Ser Val Thr Val Ser
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Glu Lys Gly Leu Thr Ala Lys Val His Lys Leu Gly Asp Lys Ala Val
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Arg Ile Gly Ala Gly Ala Gln Val Arg Glu Tyr Thr Ala Ile Leu Asp
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Pro Val Gly Tyr Ser Pro Lys Thr Lys Ser Ala Leu Ser Asp Gly Lys
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165 170 175

gcc aaa gcc ctc cgc aaa acc gat aaa aaa gac agc gcg aac gca gcc 694
Ala Lys Ala Leu Arg Lys Thr Asp Lys Lys Asp Ser Ala Asn Ala Ala
180 185 190

gtc aaa ccg gcg tac aac ggc aaa acc cat acc gtc cgc aaa ggc gaa 742
Val Lys Pro Ala Tyr Asn Gly Lys Thr His Thr Val Arg Lys Gly Glu
195 200 205

acg gtc aaa cag att gcc gcc gcc atc cgc ccg aaa cac ctg acg ctc 790
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225 230 235 240

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His Gly Arg Leu Arg Ala Gly Ser Val Leu His Ile Pro Asn Leu Asn
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Arg Ile Lys Ala Glu Gln Pro Lys Pro Gln Thr Ala Lys Pro Lys Ala
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tct gcc atc gac acg ccg acc gac gaa acc ggt aac gcc gtt tcc gaa 1174
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cct gtc gaa cag gtt tct gcc gaa gaa gaa acc gaa agc gga ctg ttc 1222
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370 375 380

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acc caa aaa cgc gcg gat gcc gat tgg aac gcc atc gaa tcc aca gac 1654
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Ser Val Tyr Glu Pro Glu Thr Phe Asn Pro Tyr Asn Pro Val Glu Ile
515 520 525

gtc atc gac acg ccc gaa ccg gaa tct gtc gcc caa act gcc gaa aac 1750
Val Ile Asp Thr Pro Glu Pro Glu Ser Val Ala Gln Thr Ala Glu Asn
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Lys Pro Glu Thr Val Asp Thr Asp Phe Ser Asp Asn Leu Pro Ser Asn
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Asn His Ile Gly Thr Glu Glu Thr Ala Ser Ala Lys Pro Ala Ser Pro
565 570 575

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625 630 635 640

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660 665 670

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Pro Ser Glu Val Pro Ala Val Glu Glu Asn Ala Ala Glu Ile Val Ala
675 680 685

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Glu Glu Asn Val Thr Lys Thr Val Ala Glu Ile Pro Asp Phe Asn Ala
740 745 750

acc gca gac gat ttg tcc gca tta ctt caa cct tct gaa gta ccg gcc 2422
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755 760 765

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Val Glu Glu Asn Ala Ala Glu Ile Thr Leu Glu Thr Pro Asp Ser Asn
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acc tct gag gca gac gct ttg ccc gac ttc ctg aaa gac ggc gag gag 2518
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785 790 795 800

gaa acg gta gat tgg agc atc tac ctc tcg gaa gaa aat atc cca aat 2566
Glu Thr Val Asp Trp Ser Ile Tyr Leu Ser Glu Glu Asn Ile Pro Asn
805 810 815

aat gca gat acc agt ttc cct tcg gaa tct gta ggt tct gac gcg cct 2614
Asn Ala Asp Thr Ser Phe Pro Ser Glu Ser Val Gly Ser Asp Ala Pro
820 825 830

tcc gaa gcg aaa tac gac ctt gcc gaa atg tat ctc gaa atc ggc gac 2662
Ser Glu Ala Lys Tyr Asp Leu Ala Glu Met Tyr Leu Glu Ile Gly Asp
835 840 845

cgc gat gcc gct gcc gag aca gtg cag aaa ttg ctg gaa gaa gcg gaa 2710
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850 855 860

ggc gac gta ctc aaa cgt gcc caa gca ttg gcg cag gaa ttg ggt att 2758
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Glu Lys Gly Leu Thr Ala Lys Val His Lys Leu Gly Asp Lys Ala Val
100 105 110

Ile Ala Val Ser Ser Glu Gln Ala Val Arg Asp Pro Val Leu Val Phe
115 120 125

Arg Ile Gly Ala Gly Ala Gln Val Arg Glu Tyr Thr Ala Ile Leu Asp
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Thr His Arg Lys Thr Ala Pro Thr Ala Glu Ser Gln Glu Asn Gln Asn
165 170 175

Ala Lys Ala Leu Arg Lys Thr Asp Lys Lys Asp Ser Ala Asn Ala Ala
180 185 190

Val Lys Pro Ala Tyr Asn Gly Lys Thr His Thr Val Arg Lys Gly Glu
195 200 205

Thr Val Lys Gln Ile Ala Ala Ala Ile Arg Pro Lys His Leu Thr Leu
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Glu Gln Val Ala Asp Ala Leu Leu Lys Ala Asn Pro Asn Val Ser Ala

225 230 235 240

His Gly Arg Leu Arg Ala Gly Ser Val Leu His Ile Pro Asn Leu Asn

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Arg Ile Lys Ala Glu Gln Pro Lys Pro Gln Thr Ala Lys Pro Lys Ala

260 265 270

Glu Thr Ala Ser Met Pro Ser Glu Pro Ser Lys Gln Ala Thr Val Glu

275 280 285

Lys Pro Val Glu Lys Pro Glu Ala Lys Val Ala Ala Pro Glu Ala Lys

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Ala Glu Lys Pro Ala Val Arg Pro Glu Pro Val Pro Ala Ala Asn Thr

305 310 315 320

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Ser Ala Ile Asp Thr Pro Thr Asp Glu Thr Gly Asn Ala Val Ser Glu

340 345 350

Pro Val Glu Gln Val Ser Ala Glu Glu Glu Thr Glu Ser Gly Leu Phe

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Gly Gly Ser Tyr Thr Leu Leu Leu Ala Gly Gly Gly Ala Ala Leu Ile

370 375 380

Ala Leu Leu Leu Leu Arg Leu Ala Gln Ser Lys Arg Ala Arg Arg

385 390 395 400

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675 680 685

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690 695 700

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755 760 765

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785 790 795 800

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Ile Ile Leu Cys Phe Ser Phe Phe Val Pro Lys Phe Ala Leu Ala Ser
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Val Asn Val Pro Gly Lys Phe Asp Arg Val Glu Val Tyr Asp Asp Gly

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Arg Tyr Leu Gly Ile Arg Gly Ser Asp Asp Lys Arg Arg Arg Ile Trp
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aaa ggt gta ttt gat aga gaa tcg gga aga tat tta act tca gaa gct 240
Lys Gly Val Phe Asp Arg Glu Ser Gly Arg Tyr Leu Thr Ser Glu Ala
65 70 75 80
caa gat tta aaa gtt agg cat gta tct act gga gca tca agt acg ggt 288
Gln Asp Leu Lys Val Arg His Val Ser Thr Gly Ala Ser Ser Thr Gly
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aaa gtt agt tcg gtt gta tct tca tca gtt tcc cgc gcc gga gtc ttg 336
Lys Val Ser Ser Val Val Ser Ser Ser Val Ser Arg Ala Gly Val Leu
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gca gga gtc ggc aaa ctt gcc cgc tta ggc gcg aaa tta agc aca agg 384
Ala Gly Val Gly Lys Leu Ala Arg Leu Gly Ala Lys Leu Ser Thr Arg
115 120 125
gca gtt cct tat gtc gga aca gcc ctt tta gcc cat gac gta tac gaa 432
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165 170 175
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Glu Asp Lys Arg Arg Ile Asn Arg Thr Tyr Gly Cys Tyr Gly Val Asp
180 185 190
agt tcg att atg cgc ctt atg tcc gat gac agc aga ttc ccc gaa gtc 624
Ser Ser Ile Met Arg Leu Met Ser Asp Asp Ser Arg Phe Pro Glu Val
195 200 205
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Lys Glu Leu Met Glu Ser Gln Met Tyr Arg Leu Ala Arg Pro Phe Trp
210 215 220

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225 230 235 240

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260 265 270

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Ile Arg Asn Ser Lys Tyr Lys Glu Met Asp Ala Lys Lys Leu Glu
275 280 285

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325 330 335

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340 345 350

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355 360 365

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370 375 380

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385 390 395 400

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465 470 475 480

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485 490 495

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Val Thr Phe Thr Val Thr Val Leu Asp Ser Ser Arg Gln Phe Ala Phe
500 505 510

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Ser Phe Glu Asn Ala Cys Thr Ile Ala Glu Arg Leu Arg Tyr Met Leu
515 520 525

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Arg Tyr Leu Gly Ile Arg Gly Ser Asp Asp Lys Arg Arg Arg Ile Trp
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145 150 155 160

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165 170 175

Glu Asp Lys Arg Arg Ile Asn Arg Thr Tyr Gly Cys Tyr Gly Val Asp
180 185 190

Ser Ser Ile Met Arg Leu Met Ser Asp Asp Ser Arg Phe Pro Glu Val
195 200 205

Lys Glu Leu Met Glu Ser Gln Met Tyr Arg Leu Ala Arg Pro Phe Trp
210 215 220

Asn Trp His Lys Glu Glu Leu Asn Lys Leu Ser Ser Leu Asp Trp Asn
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Asn Phe Val Leu Asn Ser Cys Thr Phe Asp Trp Asn Gly Gly Asp Cys
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Val Val Asn Lys Gly Asp Asp Phe Arg Asn Gly Ala Asp Phe Ser Leu
260 265 270

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Thr Lys Val Asn Met Gly Pro Val Thr Asp Arg Asn Gly Asn Pro Val
325 330 335

Gln Val Val Ala Thr Phe Gly Arg Asp Ser Gln Gly Asn Thr Thr Val
340 345 350

Asp Val Gln Val Ile Pro Arg Pro Asp Leu Thr Pro Gly Ser Ala Glu
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Ala Pro Asn Ala Gln Pro Leu Pro Glu Val Ser Pro Ala Glu Asn Pro
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Glu Pro Asp Pro Asp Leu Asn Pro Asp Ala Asn Pro Asp Thr Asp Gly
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Gln Pro Gly Thr Arg Pro Asp Ser Pro Ala Val Pro Gly Arg Thr Asn
420 425 430

Gly Arg Asp Gly Lys Asp Gly Lys Asp Gly Lys Asp Gly Gly Leu Leu
435 440 445

Cys Lys Phe Phe Pro Asp Ile Leu Ala Cys Asp Arg Leu Pro Glu Ser
450 455 460

Asn Pro Ala Glu Asp Leu Asn Leu Pro Ser Glu Thr Val Asn Val Glu
465 470 475 480

Phe Gln Lys Ser Gly Ile Phe Gln Asp Ser Ala Gln Cys Pro Ala Pro
485 490 495

Val Thr Phe Thr Val Thr Val Leu Asp Ser Ser Arg Gln Phe Ala Phe
500 505 510

Ser Phe Glu Asn Ala Cys Thr Ile Ala Glu Arg Leu Arg Tyr Met Leu
515 520 525

Leu Ala Leu Ala Trp Ala Val Ala Ala Phe Phe Cys Ile Arg Thr Val
530 535 540

Ser Arg Glu Val
545